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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Briscoe, Kurt G.
Norris McLaughlin & Marcus, PA
875 Third Avenue, 8th Floor
New York, NY 10022

EXAMINER	
WANG, CHUN CHENG	
ART UNIT	PAPER NUMBER
1796	
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05/25/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,138	STREY ET AL.	
	Examiner	Art Unit	
	Chun-Cheng Wang	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 17-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/22/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/22/2010 has been entered.

2. Claim 16 has been cancelled. Claims 1-15 and 17-19 are now pending.

3. The objections and rejections not addressed below are deemed withdrawn.

4. The text of those sections of Title 35, U.S. Code not included in this section can be found in a prior Office Action.

Claim Rejections - 35 USC § 102

5. Claims 1-9, 14-15 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Varadaraj et al. (referenced as Varadaraj I hereinafter) (US 2003/0170512).

Varadaraj I disclose emulsion compositions comprising hydrocarbon fuel, water and alkoxylated alcohol surfactants for starting a reformer of a fuel cell system (Abstract). Varadaraj et al. disclose a method to prepare a bicontinuous emulsion (read on claim 5) by mixing hydrocarbon, water and surfactant [0005]. A bicontinuous emulsion exhibits regions of water continuity and regions of hydrocarbon continuity. A bicontinuous emulsion is by character a micro-heterogeneous biphasic fluid [0016] (read on claim 1). Distilled and deionoized water, i.e. 100% water, is suitable water source. Water-alcohol mixtures, water:alcohol ratio varies from 99.1:0.1 to 20:80, can also be used as water component of the emulsion (read on claim 2) [0018]. Hydrocarbons suitable for the emulsion can be obtained from crude oil refining processes. Low

sulfur gasoline, diesel fuel (read on claim 3, 4 and 9), jet fuel, kerosene are examples of hydrocarbons that can be utilized to prepare the emulsion (read on claim 3) [0017]. Greater than 96% reduction in interfacial tension was observed indicative of the propensity for spontaneous emulsification (read on thermodynamically stable microemulsion) of the water and hydrocarbon phases by these surfactants (read on claim 5) (Example 1, [0041]). Varadaraj I disclose an emulsion composition for fuel cell system (read on claims 15 and 18) comprising, at least 40 wt % of hydrocarbon, from 30 to 60 wt % of water, and from 0.01 to 5 wt % of at least one surfactant (read on claim 5) selected from the group consisting of alkoxylated alkyl alcohols, i.e. $R-(CH_2)_n-O-(M-O)_m-H$ where R is a methyl group, n is 5-17 and m is from 2-50 (read on claim 14, where $M = CH_2-CH_2$, m = 5 and n = 13) alkoxylated alkyl mono esters, alkoxylated alkyl diesters and mixtures thereof, i.e. amphiphilic block copolymer (read on claims 6-9 and 14) (see claim 1). The amphiphilic block copolymer surfactant molecules have size in nanometers and necessarily form a film (nanostructured) between the continuous water regions and continuous hydrocarbon regions in the bicontinuous microemulsion.

6. Claims 1-9, 15 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Varadaraj et al. (referenced as Varadaraj II hereinafter) ((US 2003/0165722).

Varadaraj II disclose a microemulsion compositions comprising hydrocarbon fuel, water and alkyl ethoxylated amine-alkyl salicylic acid complex surfactants for starting a reformer of a fuel cell system (read on claims 1 and 18) (Abstract). The microemulsion composition is a bicontinuous microemulsion comprising a coexisting mixture of at least 90 vol % of a water-in-hydrocarbon microemulsion and from 1 to 10 vol % of a hydrocarbon-in-water microemulsion (read on claim 1) [0004]. Distilled and deionoized water is suitable for the microemulsion.

Water-alcohol mixtures can also be used. The ratio of water:alcohol can vary from about 99.1:0.1 to about 20:80 (read on claim 2) [0018]. Low sulfur gasoline, naphtha, diesel fuel (read on claim 3, 4 and 9), jet fuel, kerosene are non-limiting examples of hydrocarbons that can be utilized to prepare the microemulsion (read on claim 3 and 4) [0019]. Greater than 96% reduction in interfacial tension was observed indicative of the propensity for spontaneous emulsification of the water and hydrocarbon phases by these surfactants (read on thermodynamically stable microemulsion) (read on claim 5) (Example 1, [0036]). Varadaraj II disclose one of the emulsion composition comprising, at least 40 wt % of hydrocarbon, from 30 to 60 wt % of water, and from 0.01 to 15 wt % of at least one surfactant selected from the group consisting of alkyl ethoxylated amine-alkyl salicylic acid complex, monoethanol amine-alkyl salicylic acid complex and mixtures (read on claims 5-9) (Claim 1). The complex surfactant molecules have size in nanometers and necessarily form a film (nanostructured) between the continuous water regions and continuous hydrocarbon regions in the bicontinuous microemulsion.

7. Claims 1-9, 15 and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Jakobs et al. ("Amphiphilic Block Copolymers as Efficiency Boosters for Microemulsions", Langmuir 1999, 15, 6707-6711).

Jakobs et al. disclose that block copolymers of the poly(ethylenepropylene)-*co*-poly(ethylene oxide) (PEP-PEO) type dramatically enhance the solubilization capacity of medium-chain surfactants, i.e. efficiency booster, in microemulsions, in the ternary system water-*n*-decane-$C_{10}E_4$. The effect exhibits itself in an enormous increase of the swelling of the middle phase with an associated increase in the structural length scale of the microemulsion

(Abstract). Microemulsions are thermodynamically stable and macroscopically isotropic mixtures of at least three components: water, oil, and surfactant (read on claims 1-3, 5-8, 15 and 18). Jakobs et al. also disclose phase diagrams (page 6709, Figure 2). The determination of the phase diagrams is carried out in a thermostated water bath with temperature control up to 0.02 K. The sample composition is given by the oil in water plus oil mass fraction $\alpha = m_B/(m_A + m_B)$, the overall mass fraction of the surfactant (or surfactant/polymer mixture) $\gamma = (m_C + m_D)/(m_A + m_B + m_C + m_D)$, and the mass fraction of the polymer in the surfactant/ polymer mixture $\delta = m_D/(m_C + m_D)$. All samples were prepared at $\alpha = 0.422$, corresponding to an oil/(water + oil) volume fraction $\Phi = 0.5$ (claim 17) (page 6708, Experiment, A. Phase Diagrams). The amphiphilic block copolymer surfactant molecules have size in nanometers and necessarily form a film (nanostructured) between the continuous water regions and continuous hydrocarbon regions in the bicontinuous microemulsion.

Claim Rejections - 35 USC § 103

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al. (US 2003/0170512) in view of Allgaier et al. (US 6677293 as English translation of WO 00012660).

The disclosure of Varadaraj I is adequately set forth in paragraph 5 and is incorporated herein by reference.

Varadaraj I disclose use of surfactant $C_{13}E_5$ but is silent on the using it in (water +NaCl) and n-decane-AOT (sodium bis-(2-ethyl hexyl)-sulfosuccinate) system.

Allgaier et al. disclose a microemulsion composition consisting of (water +NaCl) and n-decane-AOT-P5/5 (column 4, lines 49-51). P5/5: the alkyl chain has a molecular weight of 5000

g/mol (=u) and the poly-ethylene oxide chain has a molecular weight of 5000 g/mol (column 4, lines 1-6). FIG. 9 shows the increase in efficiency in an anionic surfactant system consisting of (water+NaCl) and n-decane-AOT-P5/5 (column 5, lines 62-64).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to utilize $C_{13}E_5$ with the (water +NaCl) and n-decane-AOT system to boost its efficiency in the same field of endeavor.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al. (US 2003/0170512) in view of Steinmann (US 2003/3307484).

The disclosure of Varadaraj I is adequately set forth in paragraph 5 and is incorporated herein by reference.

Varadaraj I is silent on additive ammonium carbonate.

Steinmann '7484 disclose ammonium carbamate, ammonium carbonate, ammonium bicarbonate and ammonia as the effective reducing agent for NO_x in the exhaust gas systems [0008].

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to utilize the teaching from Steinmann '7484 to add ammonium carbonate in the fuel composition to reduce toxic NO_x in the exhaust gas systems.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al. (US 2003/0170512) in view of Filippini et al. (US 2002/0088167).

The disclosure of Varadaraj I is adequately set forth in paragraph 5 and is incorporated herein by reference.

Varadaraj I disclose the use of polyethoxylated decanol, n =10, m = 8, but is silent on sorbitan monooleate.

Filippini disclose use of cosurfactant sorbitan monooleate which is available commercially under the name Span 80 [0121] in emulsified water-blended fuel composition.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to incorporate the commercially available sorbitan monooleate as cosurfactant in the microemulsion fuel.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al. (US 2003/0170512) in view of Filippini et al. (US 2002/0088167) and Steinmann (US 6017368).

The disclosure of Varadaraj I is adequately set forth in paragraph 5 and is incorporated herein by reference.

Varadaraj I is silent on adding ammonium acetate and ammonium oleate.

Steinmann '368 disclose addition of ammonium oleate anionic surfactant not only increases the tolerance for water but also enhance the stability of the microemulsion fuel at subfreezing temperatures (column 12, lines 19-22).

Filippini et al. disclose water-soluble, ashless (i.e. metal-free), halogen-, boron-, and phosphorus-free ammonium salts such as ammonium acetate [0103] in emulsified water-blended fuel composition. The salt functions as an emulsion stabilizer ([0108], line 2) and combustion improver ([0109], line 2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to utilize the teaching from Steinmann '368, i.e. use of ammonium oleate, and Filippini et al., i.e. addition of ammonium acetate, and combine with the microemulsion fuel of Varadaraj et al. to enhance the performance.

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Varadaraj et al. (US 2003/0170512).

The disclosure of Varadaraj I is adequately set forth in paragraph 5 and is incorporated herein by reference.

Varadaraj I is silent on the explosive.

Varadaraj I disclose the microemulsion composition as a fuel, i.e. combustible. An explosive may consist of a mixture of an oxidizer and a fuel.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to corporate the fuel in an explosive.

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jakobs et al. ("Amphiphilic Block Copolymers as Efficiency Boosters for Microemulsions", Langmuir 1999, 15, 6707-6711).

The disclosure of Jakobs et al. is adequately set forth in paragraph 7 and is incorporated herein by reference.

The microemulsion Jakobs et al. disclosed could be a fuel. The hydrocarbon, n-decane, is flammable. An explosive may consist of a mixture of an oxidizer and a fuel.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to corporate the fuel in an explosive.

Response to Arguments

14. Applicant's arguments filed 02/22/2010 have been fully considered but they are not persuasive.

15. Regarding Claims 1-9, 14, 15 and 18 are rejected under 35 USC § 102(e) as being anticipated by Varadaraj et al., US 2003/0170512; and Claims 1-9, 15 and 18 rejected under 35 U.S.C. 102(e) as being anticipated by Varadaraj et al. (US 2003/0165722).

Applicants alleged: Both Varadaraj I and Varadaraj II do not teach "microemulsion as a nanostructured mixture that simultaneously comprises a continuous aqueous phase and a continuous hydrophobic phase separated from each other by an amphiphilic film on a microscopic level"; "Varadaraj's emulsions are not thermodynamically stable" and "the term "thermodynamically stable" in connection with microemulsions means that the mixture do not phase separate upon standing for an extended period of time (e.g. one month or more)".

Response: Varadaraj I disclose a bicontinuous emulsion exhibits regions of water continuity and regions of hydrocarbon continuity. A bicontinuous emulsion is by character a micro-heterogeneous biphasic fluid [0016]. Varadaraj I disclose compositions showing spontaneous emulsification (e.g. thermodynamically stable) of water and hydrocarbon phases by surfactants [0041]. The emulsion also exhibit thermodynamic stability of cooled to -54°C to be solidified and when thawed or heated to +59°C the emulsion liquefied and retained their stability and bicontinuous nature (EXAMPLE 2). Varadaraj II discloses a bicontinuous microemulsion [0004]. Greater than 96% reduction in interfacial tension was observed indicative of the

propensity for spontaneous emulsification of the water and hydrocarbon phases by these surfactants (read on thermodynamically stable microemulsion) (Example 1, [0036]). The surfactant molecules have size in nanometers and necessarily form a film (nanostructured) between the continuous water regions and continuous hydrocarbon regions in the bicontinuous microemulsion.

The prior art of Gillberg et al., Wennerstrom et al. and Paul et al. does not define the stability of "thermodynamically stable" microemulsion in terms of hours or days. Although applicants alleged "the term "thermodynamically stable" in connection with microemulsions means that the mixture do not phase separate upon standing for an extended period of time (e.g. one month or more)", the specification does not disclose the definition of the term nor does it show stability data of the instant compositions. Applicant is advised to submit other information with respect to the stability, if it is shown to be patentably distinct from the instant invention.

16. Regarding Claims 1-9, 15 and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Jakobs et al. applicants alleged Jakobs does not disclose nanostructured microemulsion.

Jakobs use substantially identical amphiphilic block copolymer surfactant molecules having size in nanometers and necessarily form a film (nanostructured) between the continuous water regions and continuous hydrocarbon regions in the bicontinuous microemulsion. Applicant is advised to submit other information with respect to the nanostructure, if it is shown to be patentably distinct from the instant invention.

17. In view of the forgoing and applicants did not point out deficiency of the art combination, the rejections under 35 USC § 103(a) as being obvious set forth in paragraphs 7-12 of the previous Office Action hold.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Cheng Wang whose telephone number is (571)270-5459. The examiner can normally be reached on Monday to Friday w/alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571)272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/
Primary Examiner, Art Unit 1796

/CCW/